Claims:

1. An apparatus for determining a physical parameter affecting an optical sensor, said apparatus comprising:
   a) a source for emitting a radiation having a narrow linewidth at an emission wavelength λ_e;
   b) a means for varying said emission wavelength λ_e;
   c) an optical path for guiding said radiation to said optical sensor and guiding a response radiation from said optical sensor;
   d) a detector for generating a response signal to said response radiation; and
   e) an analysis module for fitting said response signal and determining therefrom said physical parameter.

2. The apparatus of claim 1, wherein said source is a narrow linewidth laser.

3. The apparatus of claim 2, wherein said narrow linewidth laser is a tunable laser selected from the group consisting of External Cavity Diode lasers, Distributed Bragg Reflector lasers, fiber lasers.

4. The apparatus of claim 1, wherein said analysis module comprises a curve fitting module for fitting a best fit curve to said response signal.

5. The apparatus of claim 1, wherein said optical sensor is selected from the group consisting of Bragg Gratings and Fabry-Perot elements.

6. The apparatus of claim 5, wherein said optical path comprises an optical fiber and said Bragg Grating is a Fiber Bragg Grating.

7. The apparatus of claim 1, wherein said means for varying said emission wavelength λ_e comprise a laser tuner.

8. The apparatus of claim 7, wherein said laser tuner comprises a scanner for scanning said emission wavelength λ_e.

9. The apparatus of claim 7, wherein said laser tuner comprises a sweeper for sweeping said emission wavelength λ_e.

10. The apparatus of claim 1, wherein said optical path comprises a waveguide.

11. The apparatus of claim 1, further comprising a tap for tapping said radiation and a wavelength meter for monitoring said emission wavelength λ_e.

12. A method for determining a physical parameter affecting an optical sensor, said method comprising:

a) emitting a radiation having a narrow linewidth at an emission wavelength λ_e;

b) providing an optical path for said radiation to said optical sensor and for a response radiation from said optical sensor;

c) varying said emission wavelength λ_e;

d) generating a response signal from said response radiation; and

e) determining said physical parameter from a fitting of said response signal.

13. The method of claim 12, wherein said optical sensor produces said response radiation by a varying a property of said radiation, said property being selected from the group consisting of transmittance, reflectance, absorbance and polarization.

14. The method of claim 12, wherein said emission wavelength λ_e is varied continuously.

15. The method of claim 14, wherein said emission wavelength λ_e is swept.

16. The method of claim 12, wherein said emission wavelength λ_e is varied discontinuously.

17. The method of claim 16, wherein said emission wavelength λ_e is scanned.

18. The method of claim 12, wherein said fitting comprises a best curve fit of said response signal.

19. The method of claim 18, wherein said fitting further comprises an analysis method selected from the group consisting of peak detection, Full Width Half Maximum (FWHM) determination, centroid detection.

20. The method of claim 18, wherein said fitting comprises a fit selected from the group consisting of a polynomial fit, a Lorentzian fit and a Gaussian fit.

21. The method of claim 12, wherein said physical parameter is selected from the group consisting of temperature, strain and pressure.

22. The method of claim 12, further comprising tapping said radiation and monitoring said emission wavelength λ_e.